Who is dying with HIV/AIDS, and how has this changed over time? Detailed Data Tables and Technical Notes

Recent changes to the presentation of Massachusetts HIV/AIDS surveillance data

Effective January 1, 2011, the Massachusetts Department of Public Health (MDPH), Bureau of Infectious Diseases, HIV/AIDS fact sheets, epidemiologic reports and other HIV data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being reported in Massachusetts. As of January 1, 2013, this resulted in the removal of 3,529 HIV/AIDS cases, of which 914 have died and 2,615 were living. These persons living with HIV/AIDS may still continue to reside and receive care in the Commonwealth. The total number of persons living with HIV/AIDS, irrespective of location at diagnosis, is the basis for MDPH service planning. This change is partially a result of increased activities required by the Centers for Disease Control and Prevention (CDC) for de-duplication among states in an effort to identify cases that are counted multiple times in the National HIV/AIDS Surveillance System. The cases are assigned to the state that reports the earliest date of AIDS diagnosis if available. If the case has not progressed to AIDS, the case is assigned to the state with the earliest HIV diagnosis date. Please note that previous HIV/AIDS fact sheets, data reports and presentations included cases that may have been first diagnosed in another state.

Also effective January 1, 2011, the MDPH HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to eliminate the presumed heterosexual exposure mode category for males; those cases have been reassigned to the no identified risk (NIR) exposure mode category. The presumed heterosexual exposure mode category was used with the intention of identifying HIV exposure mode for females when sex with males is the only reported risk factor, there is no evidence of current or past injection drug use (IDU), and behavioral risk and HIV status information about male sexual partners are unknown. Twenty-nine percent of females living with HIV/AIDS and 40% of recent female HIV diagnoses are reported in the presumed heterosexual exposure mode category. The application of the presumed heterosexual exposure mode category to males is overly inclusive in that female to male HIV transmission is biologically less probable, and there are alternate exposure modes that are possible for males, including sex with other men (MSM) or IDU. The CDC reports males diagnosed with HIV/AIDS who report sex with females as their only risk factor, without corresponding partner risk or HIV status information, in the NIR exposure mode category. This revision to report presumed heterosexual male HIV/AIDS cases as NIR will bring Massachusetts HIV/AIDS case reporting for males in alignment with CDC standards. The MDPH will maintain presumed heterosexual and heterosexual exposure mode categories for females.

To describe who is dying with HIV/AIDS and how this has changed over time, these tables and the accompanying fact sheet present a profile of deaths during the ten-year period from 2002–2011 among individuals diagnosed with HIV/AIDS. Additionally, information about deaths among people reported with AIDS for the ten-year period 2002

to 2011, as well as the years 1985, 1990, 1995, and 2000 is included for historical perspective. Death data are not available for people reported with HIV infection (non-AIDS) prior to 1999, as HIV infection was not a reportable condition before this time. Since 1999, the majority of annual deaths in persons diagnosed with HIV infection occur in persons who are reported with an AIDS diagnosis (ranging from 79% to 89%).

Death data presented in this analysis include all deaths among people reported with HIV infection or AIDS in Massachusetts. This includes deaths from all causes, including cardiovascular disease, liver disease, cancer, accidental injury, or poisoning inclusive of drug overdose. Therefore, the number of deaths reported here will vary from the number of HIV/AIDS deaths reported in *Massachusetts Deaths* by the Massachusetts Department of Public Health, Registry of Vital Records and Statistics, Bureau of Health Information, Statistics, Research and Evaluation.

On an annual basis, the HIV/AIDS Surveillance Program matches all reports of individuals living with HIV/AIDS against that year's vital statistics file of all individuals who died in Massachusetts. Additionally, death certificates with HIV/AIDS among reported underlying conditions are received by the HIV/AIDS Surveillance Program, and providers may report deaths among their patients.

Table 1. Ranking of ten leading underlying causes of death among persons 25–44 years of age: Massachusetts, 2010

Cause	Ranking	N	% of Total Deaths (N=1,823)
Unintentional Injuries	1	475	26.1%
Cancer	2	279	15.3%
Heart Disease	3	214	11.7%
Suicide	4	211	11.6%
Homicide	5	80	4.4%
Ill-defined conditions-signs and symptoms	6	52	2.9%
Chronic liver disease	7	41	2.2%
Stroke	8	34	1.9%
HIV/AIDS	9	28	1.5%
Diabetes	10	23	1.3%

[1] Deaths where investigation has not determined whether injuries were accidental or purposely inflicted.
Data Source: MDPH Bureau of Health Information, Statistics, Research and Evaluation, Massachusetts Deaths 2010, available online at http://www.mass.gov/eohhs/docs/dph/research-epi/death-report-10.pdf

Table 2. Deaths among persons reported with HIV infection (non-AIDS) and AIDS by year of death: Massachusetts, 1985–2011[1]

	HIV	AIDS	Total HIV + AIDS
Year of death	**N**	**N**	
1985	--[2]	118	--[2]
1986	--[2]	196	--[2]
1987	--[2]	316	--[2]
1988	--[2]	408	--[2]
1989	--[2]	539	--[2]
1990	--[2]	618	--[2]
1991	--[2]	787	--[2]
1992	--[2]	882	--[2]
1993	--[2]	1,010	--[2]
1994	--[2]	1,157	--[2]
1995	--[2]	1,133	--[2]
1996	--[2]	757	--[2]
1997	--[2]	372	--[2]
1998	--[2]	320	--[2]
1999	47	337	384
2000	39	312	351
2001	58	356	414
2002	56	312	368
2003	66	322	388
2004	40	303	343
2005	46	275	321
2006	34	282	316
2007	44	242	286
2008	60	222	282
2009	48	236	284
2010	50	205	255
2011	35	173	208

[1] Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being reported in Massachusetts.

[2] HIV infection reporting was implemented in 1999; therefore there are minimal data for deaths among people with HIV that did not progress to AIDS during this time period.

Data Source MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), Data as of 1/1/13

Table 3. Deaths among persons reported with HIV/AIDS by gender and year of death: Massachusetts[1], 2002–2011

	Male		Female		Total
Year of death	**N**	**%**	**N**	**%**	**N**
2002	261	71%	107	29%	**368**
2003	255	66%	133	34%	**388**
2004	251	73%	92	27%	**343**
2005	224	70%	97	30%	**321**
2006	227	72%	89	28%	**316**
2007	201	70%	85	30%	**286**
2008	205	73%	77	27%	**282**
2009	192	68%	92	32%	**284**
2010	179	70%	76	30%	**255**
2011	150	72%	58	28%	**208**

[1] Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being reported in Massachusetts.
Data Source MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), Data as of 1/1/13

Table 4. Deaths among persons reported with HIV/AIDS by place of birth and year of death: Massachusetts[1], 2002–2011

	US		Puerto Rico/ US Dependency[2]		Non-US		Total
Year of Death	**N**	**%**	**N**	**%**	**N**	**%**	**N**
2002	282	77%	52	14%	34	9%	**368**
2003	302	78%	52	13%	34	9%	**388**
2004	257	75%	57	17%	29	8%	**343**
2005	236	74%	59	18%	26	8%	**321**
2006	244	77%	44	14%	28	9%	**316**
2007	229	80%	35	12%	22	8%	**286**
2008	207	73%	40	14%	35	12%	**282**
2009	214	75%	38	13%	32	11%	**284**
2010	195	76%	39	15%	21	8%	**255**
2011	156	75%	30	14%	22	11%	**208**

[1] Effective, January 1, 2011 the Massachusetts Department of Public Health, Office of HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being diagnosed and reported in Massachusetts.
[2] Ninety-eight percent of all people diagnosed with HIV infection in MA who were born in a US dependency were born in Puerto Rico, 1% were born in the US Virgin Islands, <1% were born in American Samoa, <1% were born in Guam and 1% were born in an unspecified dependency.
Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), data as of 1/1/13

Table 5. Deaths among persons reported with HIV/AIDS by race/ethnicity and year of death: Massachusetts[1], 2002–2011

	White (NH)		Black (NH)		Hispanic/Latino		API		Total[2]
	N	%	N	%	N	%	N	%	N
2002	177	48%	104	28%	83	23%	3	1%	**368**
2003	187	48%	109	28%	89	23%	1	<1%	**388**
2004	170	50%	86	25%	85	25%	2	1%	**343**
2005	150	47%	83	26%	85	26%	3	1%	**321**
2006	167	53%	78	25%	69	22%	2	1%	**316**
2007	146	51%	78	27%	61	21%	1	<1%	**286**
2008	138	49%	76	27%	62	22%	5	2%	**282**
2009	131	46%	75	26%	72	25%	6	2%	**284**
2010	118	46%	63	25%	68	27%	3	1%	**255**
2011	107	51%	56	27%	44	21%	0	0%	**208**

[1] Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being reported in Massachusetts.
[2] Totals include American Indian/Alaskan Native individuals and those of other or undetermined race/ethnicity
(NH) = Non-Hispanic, API = Asian/Pacific Islander
Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), data as of 1/1/13

Table 6. Deaths among males reported with HIV/AIDS by race/ethnicity and year of death: Massachusetts[1], 2002–2011

	White (NH)		Black (NH)		Hispanic/Latino		API		Total[2]
	N	%	N	%	N	%	N	%	N
2002	135	52%	66	25%	56	21%	3	1%	**261**
2003	123	48%	67	26%	64	25%	1	<1%	**255**
2004	134	53%	56	22%	59	24%	2	1%	**251**
2005	109	49%	53	24%	59	26%	3	1%	**224**
2006	131	58%	47	21%	47	21%	2	1%	**227**
2007	116	58%	38	19%	46	23%	1	<1%	**201**
2008	108	53%	53	26%	38	19%	5	2%	**205**
2009	86	45%	53	28%	47	24%	6	3%	**192**
2010	88	49%	39	22%	49	27%	2	1%	**179**
2011	80	53%	38	25%	31	21%	0	0%	**150**

[1] Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being reported in Massachusetts.
[2] Totals include American Indian/Alaskan Native individuals and those of other or undetermined race/ethnicity
(NH) = Non-Hispanic, API = Asian/Pacific Islander
Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), data as of 1/1/13

Table 7. Deaths among females reported with HIV/AIDS by race/ethnicity and year of death: Massachusetts[1], 2002–2011

	White (NH)		Black (NH)		Hispanic/Latina		API		Total[2]
	N	%	N	%	N	%	N	%	N
2002	42	39%	38	36%	27	25%	0	0%	**107**
2003	64	48%	42	32%	25	19%	0	0%	**133**
2004	36	39%	30	33%	26	28%	0	0%	**92**
2005	41	42%	30	31%	26	27%	0	0%	**97**
2006	36	40%	31	35%	22	25%	0	0%	**89**
2007	30	35%	40	47%	15	18%	0	0%	**85**
2008	30	39%	23	30%	24	31%	0	0%	**77**
2009	45	49%	22	24%	25	27%	0	0%	**92**
2010	30	39%	24	32%	19	25%	1	1%	**76**
2011	27	47%	18	31%	13	22%	0	0%	**58**

[1] Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being reported in Massachusetts.
[2] Totals include American Indian/Alaskan Native individuals and those of other or undetermined race/ethnicity
(NH) = Non-Hispanic, API = Asian/Pacific Islander
Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), data as of 1/1/13

Table 8. Deaths among persons reported with HIV/AIDS by exposure mode and year of death: Massachusetts[1], 2002–2011

	MSM		IDU		MSM/ IDU		HTSX		Pres. HTSX[2]		Undeter-mined[3]		Total[4]
	N	%	N	%	N	%	N	%	N	%	N	%	N
2002	74	20%	199	54%	15	4%	33	9%	12	3%	26	7%	**368**
2003	66	17%	195	50%	17	4%	47	12%	9	2%	46	12%	**388**
2004	64	19%	172	50%	18	5%	32	9%	12	3%	38	11%	**343**
2005	55	17%	166	52%	15	5%	38	12%	18	6%	27	8%	**321**
2006	62	20%	159	50%	19	6%	31	10%	15	5%	27	9%	**316**
2007	64	22%	125	44%	26	9%	28	10%	13	5%	25	9%	**286**
2008	57	20%	127	45%	15	5%	26	9%	12	4%	41	15%	**282**
2009	43	15%	143	50%	9	3%	35	12%	14	5%	39	14%	**284**
2010	56	22%	117	46%	14	5%	18	7%	9	4%	37	15%	**255**
2011	41	20%	88	42%	15	7%	22	11%	7	3%	32	15%	**208**

[1] Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being reported in Massachusetts.
[2] Includes female sex with male of unknown HIV status or risk. This category is limited to females.
[3] Includes male sex with female of unknown HIV status or risk, those still being followed up for risk information, those who have died with no determined risk, and those lost to follow-up.
[4] Totals include pediatric and blood/blood products exposure modes
MSM = Male-to-Male Sex; IDU = Injection Drug Use; HTSX = Heterosexual Sex; Pres. HTSX = Presumed Heterosexual Sex
Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), Data as of 1/1/13

Note: The category of "presumed heterosexual" is used in Massachusetts to re-assign females who are reported with an exposure of heterosexual sex, but only with a partner

of unknown HIV status or behavioral risk. Massachusetts uses the category of presumed heterosexual to distinguish these female cases from other undetermined cases about which we know less. Prior to January 1, 2011, the presumed heterosexual category was also used to report HIV data in males. The rationale for the application of the presumed heterosexual exposure mode category to females only has been addressed in the MDPH OHA report "Intersecting Risks: HIV Infection among Heterosexual Women and Men in Massachusetts." (2010) http://www.mass.gov/Eeohhs2/docs/dph/aids/intersecting_risks.pdf. Nationally, the Centers for Disease Control and Prevention categorize "presumed heterosexual" cases as "no identified risk" (NIR). As such, comparisons of the presumed heterosexual category cannot be made to national data. Caution should be used in interpreting data for presumed heterosexual, as it is still not clear what the exposure risk was for females in this category. Although a person may not report other risk behaviors, such as injection drug use to a health care provider, it does not exclude the possibility that an individual has experienced these other risks. There are many barriers to disclosing HIV risk behaviors in the health care setting such as a limited patient-provider relationship or stigma.

Table 9. Deaths among *males* reported with HIV/AIDS by exposure mode and year of death: Massachusetts[1], 2002–2011

	MSM		IDU		MSM/IDU		HTSX		Undetermined[2]		Total[3]
	N	%	N	%	N	%	N	%	N	%	N
2002	74	28%	132	51%	15	6%	9	3%	25	10%	**261**
2003	66	26%	119	47%	17	7%	19	7%	30	12%	**255**
2004	64	25%	114	45%	18	7%	17	7%	32	13%	**251**
2005	55	25%	113	50%	15	7%	14	6%	25	11%	**224**
2006	62	27%	106	47%	19	8%	11	5%	26	11%	**227**
2007	64	32%	78	39%	26	13%	9	4%	22	11%	**201**
2008	57	28%	83	40%	15	7%	13	6%	33	16%	**205**
2009	43	22%	93	48%	9	5%	13	7%	33	17%	**192**
2010	56	31%	71	40%	14	8%	5	3%	30	17%	**179**
2011	41	27%	55	37%	15	10%	10	7%	28	19%	**150**

[1] Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being reported in Massachusetts.
[2] Includes male sex with female of unknown HIV status or risk, those still being followed up for risk information, those who have died with no determined risk, and those lost to follow-up.
[3] Totals include pediatric and blood/blood products exposure modes.
MSM = Male-to-Male Sex; IDU = Injection Drug Use; MSM/IDU = Male-to-Male Sex and Injection Drug Use; HTSX = Heterosexual Sex
Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), data as of 1/1/13

Table 10. Deaths among *females* reported with HIV/AIDS by exposure mode and year of death: Massachusetts[1], 2002–2011

	IDU		HTSX		Pres. HTSX[2]		Undetermined[3]		Total[4]
	N	%	N	%	N	%	N	%	N
2002	67	63%	24	22%	12	11%	1	1%	**107**
2003	76	57%	28	21%	9	7%	16	12%	**133**
2004	58	63%	15	16%	12	13%	6	7%	**92**
2005	53	55%	24	25%	18	19%	2	2%	**97**
2006	53	60%	20	22%	15	17%	1	1%	**89**
2007	47	55%	19	22%	13	15%	3	4%	**85**
2008	44	57%	13	17%	12	16%	8	10%	**77**
2009	50	54%	22	24%	14	15%	6	7%	**92**
2010	46	61%	13	17%	9	12%	7	9%	**76**
2011	33	57%	12	21%	7	12%	4	7%	**58**

[1] Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being reported in Massachusetts.
[2] Includes female sex with male of unknown HIV status or risk. This category is limited to females.
[3] Includes those still being followed up for risk information, those who have died with no determined risk and those lost to follow-up.
[4] Totals include pediatric and blood/blood products exposure modes
IDU = Injection Drug Use; HTSX = Heterosexual Sex; Pres. HTSX = Presumed Heterosexual Sex
Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), data as of 1/1/13

Technical Notes: Explanation of Crude and Age-Adjusted Rates of Death

A rate of a disease per 100,000 population is a more precise way to compare groups that have substantially different population sizes rather than relying on the raw number of deaths. To adjust for fluctuations in the annual rate of death among people reported with HIV/AIDS, an average annual rate of death for the period 2009 to 2011 is used. The average number of deaths is calculated over the three-year period by adding the total number of deaths among people reported with HIV/AIDS in each of the three years and dividing by three. The crude average annual rate of death is then calculated by dividing the average number of people reported with HIV/AIDS who died during the three years by the entire population (everyone or the sub-population involved) and multiplying by 100,000. (See example 1 below). The Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2010 file is the source of population sizes for these calculations.

Example 1: Calculation of Crude Average Annual Rate of Death among People Reported with HIV/AIDS for White Individuals, Massachusetts, 2009–2011 (2.4 per 100,000)

Crude average annual rate of death among reported HIV/AIDS cases for white individuals, 2009–2011	= (((number of white individuals reported with HIV/AIDS who died in 2009 + number of white individuals reported with HIV/AIDS who died in 2010 + number of white individuals reported with HIV/AIDS who died in 2011) ÷ 3) ÷ population size of white individuals) × 100,000 = (((131 + 118 + 107) ÷ 3) ÷ 5,132,633) × 100,000 = ((356 ÷ 3) ÷ 5,132,633) × 100,000 = (118.6667÷ 5,132,633) × 100,000 = 0.000023120× 100,000 = **2.3**

Sometimes, in addition to the population size being different, the age composition of the populations is different. In Massachusetts, black and Hispanic/Latino populations are younger than white. The median age of the black non-Hispanic population (29.7 years) and the Hispanic/Latino population (24.5 years) is younger than that of white population (38.8 years). Therefore, it is necessary to “age-adjust” the rate of death among people reported with HIV/AIDS to get a true comparison of the impact of the disease across racial/ethnic groups without an effect from the differences in age composition. Age-adjustment of rates minimizes the distortion created by differences in age composition.

Age-adjusted rates are calculated by weighting the age-specific rates for a given population by the age distribution of a standard population. The age-specific rates are calculated for eleven age groups ranging from less than one year old to 85 years or above and are weighted by the 2000 US standard population. The weighted age-

specific rates are then added to produce the adjusted rate for all ages combined. (See example 2 below).

Example 2: Calculation of Age-adjusted Rate of Death among People Reported with HIV/AIDS for White Individuals, Massachusetts, 2009–2011, (1.9 per 100,000)

A	*B*	*C*	*D*	*E*
Age group (in years)	Average number of deaths among reported HIV/AIDS cases 2009–2011	Population (2010)	2000 US standard population weight	Age-adjusted rate ((B÷C×D)×100,000))
<1	0	48,010	0.013818	0.00
1-4	0	200,452	0.055317	0.00
5-14	0	571,967	0.145565	0.00
15-24	0.333333	677,899	0.138646	0.01
25-34	1	603,245	0.135573	0.02
35-44	19.66667	676,064	0.162613	0.47
45-54	52	841,315	0.134834	0.83
55-64	36	697,852	0.087247	0.45
65-74	7.333333	403,518	0.066037	0.12
75-84	2.333333	275,380	0.044842	0.04
85+ years	0	136,931	0.015508	0.00
Total	118.6667	5,132,633	1	**1.9**

To see the effect of age-distribution on rates of death see Table 11 below for a comparison of crude and age-adjusted rates by race/ethnicity.

Table 11. Crude and age-adjusted rates of death among people reported with HIV/AIDS per 100,000 population[1] by race/ethnicity and gender: average annual rate 2009–2011, Massachusetts[2]

State Total:	Crude Rate per 100,000	Age-Adjusted Rate per 100,000
White (non-Hispanic)	2.3	1.9
Black (non-Hispanic)	15.6	16.0
Hispanic/Latino	9.8	13.3
Mass. Total Rate	**3.8**	**3.4**
Males:	**Crude Rate per 100,000**	**Age-Adjusted Rate per 100,000**
White (non-Hispanic) Males	3.4	2.8
Black (non-Hispanic) Males	21.6	22.8
Hispanic/Latino Males	13.7	20.7
Mass. Total Rate Among Males	**5.5**	**4.9**
Females:	**Crude Rate per 100,000**	**Age-Adjusted Rate per 100,000**
White (non-Hispanic) Females	1.3	1.2
Black (non-Hispanic) Females	9.9	10.0
Hispanic/Latina Females	5.9	7.2
Mass. Total Rate Among Females	**2.2**	**2.1**

[1] The denominators for rate calculations are from the Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2010; all rates are age-adjusted using the 2000 US standard population.
[2] Effective, January 1, 2011 the Massachusetts Department of Public Health, Office of HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being diagnosed and reported in Massachusetts.
Data Source: MDPH HIV/AIDS Surveillance Program; data as of 1/1/13

Technical Notes: Trends in survival after an AIDS diagnosis

The following analyses describe changes over time in the survival of people who are diagnosed with AIDS in Massachusetts.

Tables 12–16 describe how many people died within 1 year of an AIDS diagnosis, between 1 and 2 years, between 2 and 3 years, etc., and up to 10 or more years for all people diagnosed with AIDS from 1987 to 2008. For example, the first column of Table 13 indicates that of 628 people diagnosed with AIDS in 1987, 250, or 40%, died within 1 year of diagnosis; 157, or 25%, died between 1 and 2 years of diagnosis; and 90, or 14%, died between 2 and 3 years of diagnosis.

It should be noted that if a person was diagnosed with AIDS in 2008, only one complete year of survival can be assessed, since this report includes data only up to January 1, 2010. Likewise, a diagnosis of AIDS in 2007 would not allow observation for more than two years, etc. These observations are relevant when interpreting the following tables and especially when comparing the distribution of survival times across years. With these caveats in mind, there has been a fairly consistent decline in the percentage of people who die within two years of an AIDS diagnosis. This most likely reflects higher rates of early diagnosis and improved care and treatment of people living with AIDS in the Commonwealth.

In comparing survival for people diagnosed in 1988 with people diagnosed in more recent years, it is evident that the proportion of people who are still alive is greater for each successive time period. More people are surviving for longer time periods after being diagnosed with AIDS. Advances in the prevention of opportunistic infections and the treatment of HIV infection over the years account for this significant increase in survival.

Table 12. Time from AIDS diagnosis to death by year of AIDS diagnosis: Massachusetts[1], 1987–1991

	1987		1988		1989		1990		1991	
Survival time[2]	N	%	N	%	N	%	N	%	N	%
<1 yr.	250	40%	257	31%	265	28%	273	26%	340	26%
1 - <2 yr.	157	25%	199	24%	216	23%	207	20%	297	23%
2 - <3 yr.	90	14%	140	17%	166	17%	192	18%	204	16%
3 - <4 yr.	44	7%	69	8%	85	9%	113	11%	114	9%
4 - <5 yr.	16	3%	35	4%	63	7%	63	6%	70	5%
5 - <6 yr.	11	2%	25	3%	44	5%	39	4%	35	3%
6 - <7 yr.	8	1%	12	1%	16	2%	14	1%	12	1%
7 - <8 yr.	5	1%	13	2%	7	1%	10	1%	13	1%
8 - <9 yr.	9	1%	3	<1%	4	<1%	10	1%	10	1%
9 - <10 yr.	0	0%	2	<1%	5	1%	7	1%	6	<1%
10+ yr.	9	1%	18	2%	28	3%	35	3%	44	3%
Still Alive	29	5%	63	8%	60	6%	89	8%	158	12%
Total	**628**	**100%**	**836**	**100%**	**959**	**100%**	**1,052**	**100%**	**1,303**	**100%**

[1] Effective, January 1, 2011 the Massachusetts Department of Public Health, Office of HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being diagnosed and reported in Massachusetts.
[2] Years between AIDS diagnosis and death
Data Source: MDPH Surveillance Program; data as of 1/1/13

Table 13. Time from AIDS diagnosis to death by year of AIDS diagnosis: Massachusetts[1], 1992–1996

	1992		1993		1994		1995		1996	
Survival time[2]	N	%	N	%	N	%	N	%	N	%
<1 yr.	335	20%	326	19%	266	19%	195	15%	97	9%
1 - <2 yr.	360	21%	345	20%	246	17%	94	7%	45	4%
2 - <3 yr.	297	18%	253	15%	116	8%	56	4%	53	5%
3 - <4 yr.	170	10%	110	6%	51	4%	50	4%	40	4%
4 - <5 yr.	59	4%	47	3%	35	2%	40	3%	41	4%
5 - <6 yr.	32	2%	34	2%	41	3%	31	2%	37	3%
6 - <7 yr.	36	2%	32	2%	26	2%	36	3%	34	3%
7 - <8 yr.	15	1%	32	2%	43	3%	44	3%	23	2%
8 - <9 yr.	32	2%	21	1%	25	2%	28	2%	25	2%
9 - <10 yr.	21	1%	22	1%	17	1%	27	2%	17	2%
10+ yr.	87	5%	110	6%	113	8%	112	8%	92	8%
Still Alive	239	14%	370	22%	435	31%	613	46%	623	55%
Total	**1,683**	**100%**	**1,702**	**100%**	**1,414**	**100%**	**1,326**	**100%**	**1,127**	**100%**

[1] Effective, January 1, 2011 the Massachusetts Department of Public Health, Office of HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being diagnosed and reported in Massachusetts.
[2] Years between AIDS diagnosis and death
Data Source: MDPH Surveillance Program; data as of 1/1/13

Table 14. Time from AIDS diagnosis to death by year of AIDS diagnosis: Massachusetts[1], 1997–2001

	1997		1998		1999		2000		2001	
Survival time[2]	N	%	N	%	N	%	N	%	N	%
<1 yr.	67	7%	53	6%	59	7%	54	7%	63	9%
1 - <2 yr.	38	4%	38	4%	31	4%	19	2%	23	3%
2 - <3 yr.	33	4%	19	2%	34	4%	25	3%	21	3%
3 - <4 yr.	28	3%	23	3%	22	3%	19	2%	14	2%
4 - <5 yr.	39	4%	27	3%	26	3%	22	3%	16	2%
5 - <6 yr.	24	3%	26	3%	18	2%	25	3%	20	3%
6 - <7 yr.	23	3%	26	3%	17	2%	13	2%	10	1%
7 - <8 yr.	22	2%	26	3%	18	2%	11	1%	12	2%
8 - <9 yr.	21	2%	18	2%	19	2%	12	2%	7	1%
9 - <10 yr.	20	2%	18	2%	12	1%	13	2%	11	2%
10+ yr.	61	7%	52	6%	31	4%	15	2%	1	<1%
Still Alive	523	58%	591	64%	592	67%	536	70%	503	72%
Total	**899**	**100%**	**917**	**100%**	**879**	**100%**	**764**	**100%**	**701**	**100%**

[1] Effective, January 1, 2011 the Massachusetts Department of Public Health, Office of HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being diagnosed and reported in Massachusetts.
[2] Years between AIDS diagnosis and death
[3] Individuals diagnosed in this year have not yet had the opportunity to survive this many years before death.
Data Source: MDPH Surveillance Program; data as of 1/1/13

Table 15. Time from AIDS diagnosis to death by year of AIDS diagnosis: Massachusetts[1], 2002–2006

	2002		2003		2004		2005		2006	
Survival time[2]	N	%	N	%	N	%	N	%	N	%
<1 yr.	44	6%	39	6%	48	7%	38	6%	32	5%
1 - <2 yr.	19	3%	18	3%	20	3%	10	1%	10	2%
2 - <3 yr.	14	2%	8	1%	15	2%	10	1%	9	1%
3 - <4 yr.	19	3%	13	2%	16	2%	8	1%	5	1%
4 - <5 yr.	13	2%	14	2%	11	2%	14	2%	6	1%
5 - <6 yr.	12	2%	10	2%	8	1%	14	2%	2	<1%
6 - <7 yr.	16	2%	13	2%	10	1%	7	1%	--[3]	--[3]
7 - <8 yr.	8	1%	6	1%	1	<1%	--[3]	--[3]	--[3]	--[3]
8 - <9 yr.	6	1%	1	<1%	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]
9 - <10 yr.	5	1%	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]
10+ yr.	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]
Still Alive	530	77%	480	80%	561	81%	577	85%	580	90%
Total	**686**	**100%**	**602**	**100%**	**690**	**100%**	**678**	**100%**	**644**	**100%**

[1] Effective, January 1, 2011 the Massachusetts Department of Public Health, Office of HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being diagnosed and reported in Massachusetts.
[2] Years between AIDS diagnosis and death
[3] Individuals diagnosed in this year have not yet had the opportunity to survive this many years before death.
Data Source: MDPH Surveillance Program; data as of 1/1/13

Table 16. Time from AIDS diagnosis to death by year of AIDS diagnosis: Massachusetts[1], 2007–2011

	2007		2008		2009		2010		2011	
Survival time[2]	N	%	N	%	N	%	N	%	N	%
<1 yr.	25	5%	31	7%	25	6%	25	6%	14	4%
1 - <2 yr.	19	3%	7	2%	3	1%	1	<1%	--[3]	--[3]
2 - <3 yr.	8	1%	6	1%	3	1%	--[3]	--[3]	--[3]	--[3]
3 - <4 yr.	5	1%	4	1%	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]
4 - <5 yr.	5	1%	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]
5 - <6 yr.	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]
6 - <7 yr.	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]
7 - <8 yr.	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]
8 - <9 yr.	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]
9 - <10 yr.	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]
10+ yr.	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]	--[3]
Still Alive	484	89%	391	89%	413	93%	369	93%	366	96%
Total	**546**	**100%**	**439**	**100%**	**444**	**100%**	**395**	**100%**	**380**	**100%**

[1] Effective, January 1, 2011 the Massachusetts Department of Public Health, Office of HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being diagnosed and reported in Massachusetts.
[2] Years between AIDS diagnosis and death
[3] Individuals diagnosed in this year have not yet had the opportunity to survive this many years before death.
Data Source: MDPH Surveillance Program; data as of 1/1/13